NORTHAMPTON CLEAN ENERGY ROADMAP

Prepared for the City of Northampton, Massachusetts

July 2014

MEISTER
CONSULTANTS GROUP

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The wide variety of financial and technical assistance programs administered by the Massachusetts Clean Energy Center (MassCEC) and the Department of Energy Resources (MassDOER) have helped to greatly increase installed renewable energy generation capacity and broadened the application of energy efficiency measures statewide. Nonetheless, additional efforts are required to fully enable the Commonwealth's clean energy potential. The Community Energy Strategies Program (CESP), delivered in partnership with local officials and community volunteers, was created to help communities identify and develop strategies for implementing the mix of clean energy projects and incentives best suited to address local interests, needs, and opportunities for clean energy development across all sectors. The goals of the CESP are:

- Increase the use of renewable energy and renewable heating and cooling technologies, building energy efficiency, and sustainable transportation.
- Assist communities and Regional Planning Authorities (RPA) to leverage existing programs to achieve common clean energy goals.

Three communities and three RPAs (partnered with four of their member communities) were selected to participate in this pilot program beginning in April 2013. Under the program, each community received grants of services provided by specialized firms under contract with MassCEC. Participating towns and RPAs were led through a planning process to (1) develop a clean energy working group, (2) establish local clean energy goals, (3) review an inventory of potential clean energy projects and strategies, and (4) select clean energy projects and strategies for inclusion into this final report, the Clean Energy Roadmap.

The Clean Energy Roadmap outlines a set of detailed, actionable steps to implementing a project, program, or policy that will increase the use of renewable energy generation, renewable heating and cooling, building energy efficiency, and sustainable transportation. It incorporates information gathered through consultations with municipal and RPA staff, meetings with the clean energy working group, and public forums. As such, it serves both as a record of the CESP process while also establishing a viable path for communities to achieve their clean energy goals.

The *Roadmap's* goals and supporting strategies were created under the leadership of the Northampton Clean Energy Working Group. Composed of local leaders – and led by the Northampton Energy and Sustainability Coordinator, Chris Mason– the Working Group collaborated with businesses, residents, and non-profit leaders across the city. Together, they discussed clean energy project objectives, potential development concerns, as well as opportunities and resources that could be leveraged to support clean energy projects in the community. The Working Group also collaborated with technical experts to assess and refine the clean energy strategies in this roadmap.

Through this process, Northampton stakeholders set an aggressive goal of reducing municipal energy use by 20 percent by 2015. In addition, Northampton has pledged to reduce energy consumption 20 percent below 2000 levels, create local clean energy jobs, and site 440 million kilowatt-hours of renewable energy as part of the Pioneer Valley Planning Commissions regional goals. Achieving these goals will require significant energy use reductions in governmental, residential, and commercial building and transportation sectors. It will additionally require the development of new renewable energy resources to provide clean energy generation to Northampton.

The following strategies, further detailed in Section 3, were identified by Northampton stakeholders as pathways to achieve these goals. Each strategy provides a summary of key information including relevant background objectives, benefits, potential risks, project costs economics, next steps, and potential contacts. Northampton's 12 clean energy strategies include:

Clean Energy Strategies

Strategy 1. Develop Community Solar Project
Strategy 2. Develop Solar Canopies for City-Owned Parking Lots
Strategy 3. Develop Solar Project at Glendale Road Landfill
Strategy 4. Expand Small Hydro Development
Strategy 5. Assess Regional Anaerobic Digestion Project Opportunities

Energy Efficiency and Resilience Strategies

Strategy 6. Implement Property Assessed Clean Energy (PACE) Financing
Strategy 7. Develop Community Energy Efficiency Mobilization Plan
Strategy 8. Implement LED Street Lighting Retrofits
Strategy 9. Implement Energy Reporting Program
Strategy 10. Increase Public Safety through Improved Community Energy Resilience

Sustainable Transportation Strategies

Strategy 11. Implement Electric Vehicle Purchasing Policy
Strategy 12. Develop Regional Bike Sharing System

As described in the following pages, Northampton has a history of successful clean energy planning and project development; however, a continued focus will be needed to achieve Northampton's long-term clean energy goals. By implementing these strategies, Northampton can take concrete steps to achieving its clean energy goals while also positioning itself as a leader in the Commonwealth and across the United States.

ACKNOWLEDGEMENTS

The Massachusetts Clean Energy Center (MassCEC) is dedicated to accelerating the success of clean energy technologies, companies and projects in the Commonwealth – while creating high-quality jobs and long-term economic growth for the people of Massachusetts. Since it began operating in 2009, MassCEC has helped clean energy companies grow, supported municipal clean energy projects, and invested in residential and commercial renewable energy installations, creating a robust marketplace for innovative clean technology companies and service providers.

The Massachusetts Department of Energy Resources (MassDOER) Green Communities Division strives to help all 351 Massachusetts cities and towns find clean energy solutions that reduce long-term energy costs and strengthen local economies. The division provides technical assistance and financial support for municipal initiatives to improve energy efficiency and increase the use of renewable energy in public buildings, facilities, and schools.

The Northampton Clean Energy Roadmap benefited from the active leadership and engagement of the **Northampton Clean Energy Working Group**. Led by Northampton Energy and Sustainability Officer Chris Mason, the Working Group guided and supported the implementation of Northampton's Community Energy Strategies process and the resulting *Clean Energy Roadmap*. Members of the Northampton Clean Energy Working Group include:

- *M.J. Adams,* Northampton Board of Public Works
- *Suzanne Beck,* Northampton Chamber of Commerce
- *Mac Everett,* Ward 3 Neighborhood Association
- *Wayne Feiden,* Northampton Planning & Sustainability Department
- *Marin Goldstein,* Center for EcoTechnology
- *Rich Horton,* Community Enterprises
- *Bill Hubbard,* Northampton Senior Center
- *Marianne LeBarge,* Northampton City Council
- *Deirdre Manning,* Smith College
- *Chris Mason,* Northampton Energy & Sustainability Officer
- *Terri Masterson,* Northampton Economic Development Director
- *Adin Maynard,* Northampton Energy & Sustainability Commission
- *David Murphy,* Northampton City Council
- *Josh Shanley,* Northampton Emergency Management Coordinator
- *Peter Wingate,* Community Action!

Meister Consultants Group (MCG) was hired by MassCEC to design and implement the community dialogue that supported community leaders in creating the Clean Energy Roadmaps. MCG is a Boston-based sustainability consulting firm that uses innovative problem solving approaches to advise clients on clean energy strategy development, stakeholder dialogue, and program implementation. MCG has an active clean energy practice, with deep expertise in creating and implementing policies and programs for local jurisdictions.

Stone Environmental conducted GIS analysis of clean energy resources and infrastructure to aid community understanding of existing clean energy opportunities. Additionally, Stone created the companion maps illustrating communities' clean energy strategies by sector. Stone is a Vermont-based GIS consulting firm specializing in collaborative, creative geospatial and web mapping solutions for government and business with a focus on renewable energy and environmental stewardship.

SECTION 1: INTRODUCTION

Northampton has a history of success in implementing clean energy projects, with a strong commitment to innovation and a track record of robust community engagement. The City is a sustainability leader within the region, and was the first Massachusetts municipality to pass regulations enabling PACE financing. In 2008, the city published the *Sustainable Northampton Comprehensive Plan*, which set goals for community-wide energy efficiency and renewable energy. Regionally, Northampton is active within the Pioneer Valley Planning Commission (PVPC). It has committed to reduce energy consumption 20 percent below 2000 levels, create local clean energy jobs, and site 440 million kilowatt-hours of renewable energy by 2020 as part of the *PVPC Clean Energy Plan*. Northampton has also developed its own aggressive Municipal Energy Reduction Plan with the goal of reducing municipal energy use 20 percent by 2015.

PAST ACCOMPLISHMENTS

The City of Northampton has full-time staff dedicated to providing support for clean energy development. Chris Mason, the City's Energy and Sustainability Coordinator, works closely with all municipal departments to further Northampton's energy goals and work within the community to promote clean energy and energy efficiency development. The City also has a formally established Energy and Sustainability Commission, a body comprised of city staff and community members which has worked on energy issues in the community since the 1980s. This network of actors has a history of completing successful clean energy projects in collaboration with Massachusetts agencies, non-profits, and the Northampton community.

Northampton has received a Green Community designation from Massachusetts for its commitment to activities which encourage renewable energy and energy efficiency. It was also selected as a STAR community, a nation-wide pilot which works to improve the sustainability of U.S. cities. Ongoing project work and policies which have led to these honors include:

Energy Efficiency

- The Northampton Mayor's office issued a LEED Certification requirement which mandates that any new City buildings or major renovations achieve LEED certification and earn as many points in energy efficiency, transportation, and renewable energy as possible.
- The City of Northampton adopted a high-efficiency vehicle purchasing policy in 2010.

Renewable and Alternative Energy

- Northampton has three active municipal rooftop solar installations on schools and learning centers. These are:
    - A 106 kW solar PV system at Smith Vocational and Agricultural High School
    - A 13 kW solar PV system at James House Community Learning Center
    - A 10 kW solar PV system at John F. Kennedy Middle School

- The City converted the fuel source of all its current municipal buildings to natural gas, propane, or heat pumps.
- A solar hot water system was installed at the waste water treatment facility in 2012.
- A passive solar wall was installed for air heating at the Smith Vocational and Agricultural High School.

Energy Policy and Planning

- The City Council adopted a Stretch Energy Code in 2009, which established energy efficiency standards for buildings that are more stringent than the base Massachusetts requirements.
- Northampton expedites the permitting and siting process for large-scale renewable energy projects.
- In 2012, the City Council voted to allow for the development of PACE financing programs for efficiency and renewable energy projects on private properties.

Community Education, Outreach and Engagement

- The Energy Concierge Program was developed as a collaborative project between the City of Northampton, the Center for EcoTechnology (CET), National Grid, and Columbia Gas to provide outreach, education, and technical assistance to commercial and industrial property owners on incentives and technology options for energy efficiency and renewable energy.
- Northampton had the highest number of participants in Massachusetts for Green Start, a renewable energy purchase program.
- Smith Vocational and Agricultural High School has added coursework on high-efficiency buildings.

SECTION 2: METHODOLOGY

NORTHAMPTON CLEAN ENERGY WORKING GROUP

The Northampton Clean Energy Working Group guided implementation of the CESP. The Working Group was supported by a project team made up of local officials and technical experts from the City of Northampton, MassCEC, MassDOER, Meister Consultants Group, and Stone Environmental. Composed of local leaders representing a diversity of perspectives, Working Group members included representatives from local government, businesses, nonprofit groups, major building or facility owners, community groups, and other key stakeholders (see Acknowledgements for the full list of Northampton Working Group members). Working Group members provided the following support over the course of the program.

- **Outreach and Mobilization:** Working Group members actively communicated with their colleagues, peers, and local stakeholders to ensure broad outreach took place. They mobilized local networks to recruit community member participation at the Community Energy Forums.
- **Working Group Meetings:** The Working Group met at key points in the CESP process to inform development of the roadmap, review inputs, discuss potential outcomes, and make concrete recommendations. In particular, Working Group members identified local community concerns and goals that guided development of the *Northampton Clean Energy Roadmap*. They additionally reviewed and approved clean energy strategies.
- **Community Clean Energy Forums:** Members participated in the planning, development, and implementation of public events and meetings, especially Community Energy 101 and 201 Forums.
- **Project Representation:** Members served as program ambassadors, representing the program at community events and reaching out to local stakeholders to encourage active participation in the development of the community clean energy roadmap.

CLEAN ENERGY 101 COMMUNITY FORUM

The Clean Energy 101 Community Forum was a public meeting that brought together local officials and stakeholders to learn about the CESP process, discuss Northampton's clean energy goals with Working Group members, and propose potential clean energy projects that could be implemented in the city.

During the 101 Forum, stakeholders proposed more than 80 potential clean energy projects, which could be implemented in the community. These projects formed the Clean Energy Inventory, which served as the starting point for assessing potential strategies that could be integrated into the *Northampton Clean Energy Roadmap*.

From this list, the Working Group identified 12 strategies that could best achieve Northampton's goals in the near to medium term. These projects served as the starting point for the clean energy strategies developed in this Roadmap (see Section 3).

CLEAN ENERGY 201 COMMUNITY FORUM

The Clean Energy 201 Community Forum was a public meeting where local officials and stakeholders engaged technical experts to discuss benefits, drawbacks, and development options for potential clean energy strategies. The Working Group identified the following four potential strategies for community stakeholders to review with experts at the 201 Forum:

- **Local Marketing for Energy Efficiency:** Local energy efficiency experts discussed the potential to expand local marketing and increase greater energy efficiency adoption in Northampton.
- **Anaerobic Digestion Development:** Officials from MassCEC discussed the opportunities and challenges of anaerobic digestion technology.
- **Landfill Solar:** MassDEP explored the potential for developing solar on the city's closed landfill.
- **Bike Share Programs:** Stakeholders discussed the challenges and opportunities of implementing a bike share program in cooperation with surrounding communities and local higher education institutions.

TECHNICAL ANALYSIS

Throughout the process, the project team conducted technical analysis to assess strategy development pathways and increase the likelihood that the proposed clean energy strategies will be implemented in the future. For example, where appropriate, Stone Environmental conducted mapping (GIS) analysis to identify sites that could support clean energy development which also addressed local community concerns. Additionally, Meister Consultants Group worked with local and state officials – among other resource providers – to identify potential funding sources or technical resources that could support project development.

CLEAN ENERGY ROADMAP

Taking into account findings from the Working Group, community members, and technical experts, the project team drafted the *Northampton Clean Energy Roadmap*. Local and state officials and Northampton Working Group members provided critical feedback on the draft roadmap. The project team integrated edits and submitted a final draft of the *Northampton Clean Energy Roadmap*, which was reviewed and approved by Working Group members as well as MassCEC and MassDOER.

CLEAN ENERGY

COMMUNITY ENERGY STRATEGIES FOR NORTHAMPTON

STRATEGY 1. DEVELOP COMMUNITY SOLAR PROJECT

A Northampton community solar project will allow residents that are unable to own their own solar installations to purchase locally produced solar electricity, saving them money and contributing to community renewable energy goals.

OBJECTIVES

★	Coordinate the development of a community solar project for Northampton residents.
★	Save participating residents money on their electricity bills.
★	Reduce community greenhouse gas emissions and promote the development of large-scale solar.

BACKGROUND AND STRATEGY DESCRIPTION

Many Northampton residents are unable to take advantage of the growing Massachusetts solar market because they either rent their residences or because their homes are unsuitable for solar. Community solar initiatives are one way to allow these residents to take advantage of low-cost solar power. Under the community solar model, a developer builds a PV system at an off-site location and participating residents agree to purchase energy from that system, typically at a discount compared to electricity from traditional electricity sources. There are a range of business models, such as direct ownership by local investors or development and financing by a third-party entity. Current Massachusetts net metering regulations are some of the most favorable in the nation for community solar projects and several municipalities have already established programs with the support of private developers.

As part of this strategy, Northampton staff will work with local volunteers to develop a community solar program, which will:

- Evaluate potential community solar ownership models.
- Identify potential city-owned or privately-owned sites within Northampton to support a community solar installation.
- Recruit potential community solar program participants.
- Assist with the procurement of a community solar program vendor.

With prices for solar installations at all-time lows and new state incentive programs that will favor community solar installations, a coordinated effort to develop a community solar initiative could significantly benefit the Northampton community.

BENEFITS

+	A community solar project will allow Northampton residents to save on their energy bills and take advantage of state solar incentives which they currently contribute to as Massachusetts utility ratepayers. Potential savings will depend on a range of factors, from the installed cost of the community solar project to the business model selected for developing the project.
+	If the City of Northampton chooses to lease city-owned property for the installation of a community solar initiative, this will result in annual lease payments from the system owners. Depending on the size of the system, these payments could be worth tens of thousands of dollars a year.
+	A large ground-mounted solar system in Northampton could also generate new tax revenue. Property taxes for ground-mounted PV systems are typically made through a Payment In-Lieu of Tax (PILOT) agreement. Like lease payments, these new tax payments could be worth tens of thousands of dollars depending on the scale of the system and the specifics of any city agreement with the system owner.

RISKS

	Launching a community solar initiative will require significant stakeholder outreach. This could require investments of time from community volunteers and city staff. Even with a robust stakeholder outreach effort, there is no way of knowing whether community interest will be sufficient to develop a community solar project.
	Implementing a community solar initiative will require significant support from volunteers within Northampton to coordinate outreach, assist with vendor procurement and help with ongoing administration of the community project. Volunteers may not be willing to commit the time needed to implement this strategy.
	Larger, ground-mounted solar PV systems require open land (roughly 5 acres per megawatt) near utility interconnection points. Northampton may not have suitable sites for a community solar project, meaning the system may need to be installed outside city limits, decreasing potential community benefits (i.e. tax payments or lease payments in the case of systems sited on city property).
	Site selection will be critical to the success of a community solar project. Some planned large ground mounted solar projects in Massachusetts have met with opposition from abutting property owners. Given this, any Northampton community solar project should seek to include neighboring property owners early in the planning process to elicit their feedback and mitigate potential concerns.

PROJECT COSTS & ECONOMICS

Table 1- Potential Community Solar Implementation Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Staff time to coordinate community volunteers. This may be minimal or substantial depending on level of volunteer involvement.	Volunteer time to coordinate program development and implementation could be minimal or significant depending on level of city involvement.
	May require third-party to assist with evaluation of business models and potential vendors.	
Financial Benefits of Strategy	Property tax payments and/or lease payments depending on final system location. These could range from $8,000 to $30,000 per year.	Participating community members will likely see reduced energy bills.

Table 2 - Available Resources

Organization	Type of Assistance	Description
IRS	Tax Incentives	The federal government provides both a 30% investment tax credit as well an accelerated 5-year depreciation schedule for qualifying solar PV installations. These incentives greatly improve PV system economics, but require system owners to have federal tax liabilities.
MassDOER	SREC Incentives	Massachusetts utilities are required to purchase a portion of their total load from qualifying in-state solar PV systems. Solar Renewable Energy Certificates (SRECs) are the mechanisms through which load serving entities meet this requirement. A community solar installation will generate SRECs that will then be sold to Massachusetts electricity suppliers.

NEXT STEPS

Task Description	Task Lead
1. Meet with community volunteers to discuss interest in developing community solar project and create local working group to lead effort.	City Staff
2. Issue a Request for Expression of Interest to seek non-binding expressions of interest and proposed business models from private, public, and nonprofit organizations to develop community-owned solar array(s) in Northampton.	City Staff
3. Select one to three acceptable business model(s).	City Staff & Working Group
4. Survey the community for interest in each business model and to estimate potential project size(s).	City Staff & Working Group
5. Issue an RFQ from private, public, and nonprofit organizations to develop community-owned solar array(s) in Northampton based on the business model(s) selected.	City Staff & Working Group

MORE INFORMATION

- **MassDOER:** The MassDOER developed a guide book to community shared solar projects titled *Community Shared Solar: Implementation Guidelines for Massachusetts Communities,* which includes a review of business and procurement models. This guide also includes model contract documents.
  http://www.mass.gov/eea/docs/doer/renewables/solar/community-shared-solar-implementation-guidelines-with-contracts-032913.pdf

- **NREL:** The National Renewable Energy Laboratory has developed a national guide for community shared solar projects titled *A Guide to Community Shared Solar: Utility, Private and Nonprofit Project Development*. This also includes a review of potential business models and project financing strategies.
  http://www.nrel.gov/docs/fy12osti/54570.pdf

- **Brewster and Harvard Solar Garden:** The Massachusetts towns of Brewster and Harvard have developed community shared solar projects.
  http://www.brewstercommunitysolargarden.com/
  http://www.harvardsolar.org/

STRATEGY 2. DEVELOP SOLAR CANOPIES ON CITY-OWNED PARKING LOTS

Parking lots are typically underutilized spaces within a community, and solar parking canopies provide one option to use these properties to support the development of local renewable energy projects.

OBJECTIVES

★	Increase opportunities for local renewable energy development.
★	Develop innovative clean energy projects on lands that are typically underutilized.
★	Lower municipal energy bills through long-term solar power purchase agreements and benefit from other potential revenue streams, including lease payments and tax revenues.

BACKGROUND AND STRATEGY DESCRIPTION

During the community engagement process, Northampton stakeholders expressed interest in identifying sites for development of solar parking canopies in the community. Solar parking canopies are structures that are anchored into a parking lot that overhang parking spaces. Solar cells are affixed to the roof of the canopy structures. Similar to rooftop or ground-mounted solar, solar canopies developed over parking lots can also provide a good opportunity for communities interested in developing large-scale solar PV systems. Though solar canopies have historically been cost-prohibitive, due in large part to the material costs of constructing freestanding canopies, developers report that because of falling installation costs they are now cost-competitive with grid power. In addition, solar canopies now benefit from new Massachusetts incentives that have been structured to encourage reuse of already-utilized land such as parking lots.

Due to falling costs, and federal and state incentives, solar PV has become increasingly cost competitive in Massachusetts over the past few years. Many municipalities in the Commonwealth are seeing significant energy bill savings after signing power purchase agreements (PPAs) with third party developers who own and operate solar installations on municipal properties. These PPAs enable local governments to purchase discounted power through long-term fixed-price contracts.

Solar canopies have a number of benefits in addition to renewable power generation, including the following:

- Potential to integrate storm water collection technologies (e.g. rain barrels, swales, etc.), reducing pollution and run-off from paved surfaces and decreasing loads on municipal wastewater infrastructure.
- Provide shade to parked cars in the summertime.
- Decreased snow build up and removal requirements in the wintertime.
- The potential to be integrated with future emergency power infrastructure.

As a result, Northampton stakeholders have indicated that solar canopies are an attractive option for the City. If developed through a municipal PPA or lease, a solar canopy project will require little to no upfront capital investment, provide guaranteed power production, and result in substantial energy cost savings (depending on

site-specific design issues and vendor installation costs). The City may also wish to evaluate direct ownership models where the city will build, own, and operate the PV system.[1]

Under this strategy, Northampton will evaluate the feasibility of developing solar canopy projects on publicly owned parking lots. This strategy includes site evaluations, analysis of costs and benefits of different ownership models, and development of a procurement strategy. This strategy could be integrated with other solar strategies outlined in this report (i.e. community solar and landfill solar) through a joint procurement process.

BENEFITS

+	Developing a solar canopy strategy will allow Northampton to better understand the potential of renewable energy projects to lower municipal operating costs and increase city revenues.
+	A municipal solar purchasing strategy will result in the development of procurement documents that can be used for other municipal clean energy projects.
+	Many of the key questions and concerns that municipal officials and staff may have about solar canopies can be thoroughly evaluated as part of the strategy development process.

RISKS

⚡	The City will need to conduct feasibility studies of Northampton parking lots and will also need to invest staff time in developing a strategy should these sites prove viable.
⚡	Northampton-owned parking structures may not be suitable for solar canopy installations.
⚡	Solar canopies may require Northampton to adjust how parking lots are maintained and plowed, however canopies can be designed to minimize these impacts.

[1] While this solar ownership model is available to municipalities, local governments cannot take advantage of federal tax benefits that can substantially improve solar project economics. This model also requires cities to assume SREC market risk.

PROJECT COSTS & ECONOMICS

Table 3 – Solar Canopies on City-Owned Parking Lots Implementation Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Staff time to evaluate canopy solar procurement strategies and potential contracting models.	Not applicable.
	Limited costs associated with hiring a firm to conduct site feasibility studies.	
Financial Benefits of Strategy	Solar projects on municipal properties will generate a number of new revenue streams for the City including savings from discounted power purchases, increased property tax payments, and potential lease revenues.	Not applicable.

Table 4 - Available Resources

Organization	Type of Assistance	Description
MassDOER	Project Development Assistance	The Department of Energy Resources (MassDOER) has a number of model documents and guides for local governments developing solar projects. These could be used as models for any Northampton solar procurement. http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/ems.html
MassDOER	SREC Incentives	Massachusetts utilities are required to purchase a portion of their total load from qualifying in-state solar PV systems. Solar Renewable Energy Certificates (SRECs) are the mechanisms through which load serving entities meet this requirement. Solar canopies will generate SRECs that can be sold to Massachusetts electricity suppliers.
IRS	Tax Incentives	The federal government provides both a 30% investment tax credit as well an accelerated 5-year depreciation schedule for qualifying solar PV installations. These incentives greatly improve PV system economics, but require system owners to have federal tax liabilities.

NEXT STEPS

Task Description	Task Lead
1. Issue an RFP for a feasibility study to identify appropriate size and locations for small PV arrays on city-owned parking lots and facilities.	Energy & Sustainability Commission, Central Services
2. Select vendor and complete study. Report to Energy & Sustainability Commission.	Central Services
3. Present findings and recommendations to City Council.	Energy & Sustainability Commission, Central Services
4. Evaluate appropriate procurement pathways including whether to procure under an RFP or RFQ and whether to conduct a joint procurement with the landfill solar project (Strategy 3).	Energy & Sustainability Commission, Central Services
5. Develop and publish procurement documents.	Public Works, Central Services

CONTACTS

Organization	Name	Position	Email
MassDOER	Eileen McHugh	Public Procurement/Municipal Energy Programs Manager	eileen.mchugh@state.ma.us

MORE INFORMATION

- **Massachusetts SREC Program:** The MassDOER has carved-out a portion of the RPS Class I Renewable Energy requirement to support distributed solar photovoltaic (PV) energy facilities. The RPS Solar Carve-Out is a market-based incentive to support residential, commercial, public, and non-profit entities in developing 1600 MW of solar photovoltaic (PV) across the Commonwealth. http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/rps-solar-carve-out/

- **Federal Business Investment Tax Credit (ITC):** The business ITC is equal to 30% of expenditures, with no maximum credit. Eligible solar energy property includes equipment that uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat. http://programs.dsireusa.org/system/program/detail/658

  Federal 5-Year MACRS Depreciation: Under MACRS, businesses may recover investments in certain property through depreciation deductions. A number of renewable energy technologies, including solar PV, are classified as five-year property. http://programs.dsireusa.org/system/program/detail/676

- **MassDOER Guide to EMS Procurement:** The MassDOER prepared this document to help municipalities and school departments understand how to improve the energy efficiency of public buildings through Energy Management Services (EMS) contracting. This document provides a guideline for implementing EMS projects**.** http://www.mass.gov/eea/docs/doer/green-communities/pubs-reports/ems-guide.pdf.
  Additionally, for model procurement documents, see:
  http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/ems.html

STRATEGY 3. DEVELOP SOLAR PROJECT AT GLENDALE ROAD LANDFILL

Reduce Northampton's energy costs and create new sources of revenue by developing a third-party owned solar PV system at the City's closed landfill.

OBJECTIVES

✪	Develop and implement a strategy for installing a solar photovoltaic system (PV) at the Northampton landfill on Glendale Road.
✪	Reduce City energy costs by signing a net metering credit contract and develop alternative revenue streams through property tax and lease payments.

BACKGROUND AND STRATEGY DESCRIPTION

Solar PV has become increasingly cost competitive in the last few years and federal and state incentives have made solar attractive in Massachusetts. Closed landfills can be excellent sites for solar development, as these properties are typically large open spaces with limited reuse value. A number of municipalities have worked with private developers and MassDEP to repurpose closed landfills for solar PV system development. These cities and towns have been able to sign lease and power purchase agreements that result in significant new revenue streams for their communities. New Massachusetts solar incentives will provide added value for PV systems on landfills, making landfill solar development even more attractive in the Commonwealth.

The Northampton landfill on Glendale Road has previously undergone a site analysis by the Smith College Engineering Design Clinic class. This preliminary analysis found the site to have good potential for the installation of a megawatt-scale ground-mounted solar array that could meet roughly 50% of the City's annual electricity demand. This site could also potentially be developed to benefit the Northampton community more widely under a community solar model or in conjunction with city-wide solar canopy procurement (see Strategies 2 and 3).

Under this strategy, Northampton will further evaluate the Glendale Road landfill for solar development and create a solar development strategy. This will include internal coordination of Northampton staff as well as staff from MassDEP and MassDOER. This strategy will be implemented in coordination with the solar canopy strategy to leverage staff resources and lower overall project development costs.

BENEFITS

+	Developing a landfill solar project will allow Northampton to better understand the potential of renewable energy projects to lower municipal operating costs and increase city revenues.
+	Developing a solar landfill project could result in long-term lease and tax payments for Northampton as well as reduced electricity costs.

RISKS

	While the closed landfill at Glendale Road has been evaluated for solar, other fatal flaws may be found during the site assessment and project development process that make the site unsuitable for solar.
	The state is beginning a new round of solar incentives and project developers may not find these new incentives as attractive as under previous programs. If this is the case, the economics of the Glendale Road landfill project may not be compelling enough for Northampton to go forward with a project.
	In other communities, neighboring property owners have expressed concern about the development of large-scale solar installations near their properties. Given this, Northampton should work to include neighborhood groups in the earliest stages of the development process.

PROJECT COSTS & ECONOMICS

Table 5 – Solar Project at Glendale Road Landfill Implementation Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Northampton staff will need to dedicate time to develop and implement a procurement strategy. Project oversight and coordination with the solar vendor will also require staff time commitments.	Not applicable.
Financial Benefits of Strategy	Potentially significant cost savings from a long-term power purchase agreement and other revenues.	The Glendale Road landfill could be developed in whole or in part as a community solar project, which will provide discounted power to participating Northampton residents.

Table 6 - Available Resources

Organization	Type of Assistance	Description
MassDOER	Technical Assistance	The Department of Energy Resources (MassDOER) has a number of model documents and guides for local governments developing solar projects. These could be used as models for any Northampton solar procurement. http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/ems.html
MassDOER	SREC Incentives	Massachusetts utilities are required to purchase a portion of their total load from qualifying in-state solar PV systems. Solar Renewable Energy Certificates (SRECs) are the mechanisms through which load serving entities meet this requirement. A landfill solar installation will generate SRECs that can be sold to Massachusetts electricity suppliers.
MassDEP	Technical Assistance	MassDEP works with communities to support the development of clean energy projects on closed landfill sites through the Clean Energy Results Program. http://www.mass.gov/eea/agencies/massdep/climate-energy/energy/program/

NEXT STEPS

Task Description	Task Lead
1. Convene a community discussion regarding development of solar projects in Northampton. This should integrate both solar canopies on parking structures and the landfill property. Make recommendations to the City Council.	Energy & Sustainability Commission
2. Evaluate appropriate procurement pathways including whether to procure under an RFQ or RFP and whether to procure both the landfill and solar canopies together.	Energy & Sustainability Officer, Public Works, Central Services
3. Develop and publish procurement documents.	Public Works, Central Services

CONTACTS

Organization	Name	Position	Email
MassDOER	Eileen McHugh	EMS Procurement Lead	eileen.mchugh@state.ma.us
MassDEP	David Howland	Western Region Clean Energy Lead	david.howland@state.ma.us

MORE INFORMATION

- **Massachusetts SREC Program:** The MassDOER has carved-out a portion of the RPS Class I Renewable Energy requirement to support distributed solar photovoltaic (PV) energy facilities. The RPS Solar Carve-Out is a market-based incentive to support residential, commercial, public, and nonprofit entities in developing 1,600 MW of solar PV across the Commonwealth. http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/rps-solar-carve-out/

- **Federal Business Investment Tax Credit (ITC):** The business ITC is equal to 30% of expenditures, with no maximum credit. Eligible solar energy property includes equipment that uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat. http://programs.dsireusa.org/system/program/detail/658

- **Federal 5-Year MACRS Depreciation:** Under MACRS, businesses may recover investments in certain property through depreciation deductions. A number of renewable energy technologies, including solar PV, are classified as five-year property. http://programs.dsireusa.org/system/program/detail/676

- **MassDOER Guide to EMS Procurement:** The MassDOER prepared this document to help municipalities and school departments understand how to improve the energy performance of public buildings through Energy Management Services (EMS) contracts. This document provides a guideline for implementing an EMS project**.** http://www.mass.gov/eea/docs/doer/green-communities/pubs-reports/ems-guide.pdf.
  Additionally, for model procurement documents, see:
  http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/ems.html

- **MassDOER Guide to Solar on Landfills:** The MassDOER developed a step-by-step guide to developing landfill solar projects. It describes key site criteria and reviews various potential development pathways available to municipalities under Massachusetts law.
  http://www.mass.gov/eea/docs/doer/green-communities/pubs-reports/pvlandfillguide.pdf

- **Massachusetts Department of Environmental Protection**: MassDEP actively works with local governments to provide assistance in developing clean energy projects on closed landfill sites.
  http://www.mass.gov/eea/agencies/massdep/service/energy/landfills/
  http://www.mass.gov/eea/agencies/massdep/climate-energy/energy/program/

STRATEGY 4. EXPAND SMALL HYDRO DEVELOPMENT

Explore opportunities to encourage the development of small hydroelectric generating stations at existing dam sites within Northampton.

OBJECTIVES

	Encourage the development of small hydroelectric projects at appropriate sites within the City.

BACKGROUND AND STRATEGY DESCRIPTION

Small-scale hydroelectric power can be a low-cost, environmentally friendly source of power, and Northampton has a number of waterways and existing dams that may be suitable for this energy generation technology. Both Cookes Dam on the Mill River and Paradise Pond on the Smith Campus, have been discussed as potential sites for small-scale hydro power, and the Smith site has already been the subject of favorable feasibility analysis. Under this strategy, Northampton will work with interested stakeholders to encourage the development of these and other appropriate sites within the community. The Energy and Sustainability Commission will develop suitable strategies for furthering these potential projects in the near term. This will include outreach and support to dam owners and, if appropriate, providing assistance with project development. In order to minimize the potential environmental impacts of this strategy, only dam sites not likely to be removed in the near future will be evaluated.

BENEFITS

	Encouraging the development of small hydro facilities at existing dams will have a number of greenhouse gas benefits for the Northampton community.
	The strategies used to encourage local dam owners to develop small hydro projects by the Energy and Sustainability Commission may be used to support the development of other renewable energy technologies in Northampton.

RISKS

	The dams listed in this strategy may have fatal flaws that could prevent private development of the sites.

PROJECT COSTS & ECONOMICS

Implementation of this strategy requires minimal effort by the City of Northampton beyond arranging discussions between project stakeholders as necessary. Potential resources for a small hydro project are currently limited. However, developers and site owners are likely to be able to develop projects under a third party ownership model.

NEXT STEPS

Task Description	Task Lead
Present this strategy to the Energy and Sustainability Commission for further discussion and development. If the Commission is supportive, reach out to dam owners to gauge interest in small hydro project development.	Energy & Sustainability Committee

CONTACTS

Organization	Name	Position	Email
Smith College	Deirdre Manning	Director of Environment and Sustainability	dmanning@smith.edu
MassCEC	Amy Barad	Program Director	abarad@masscec.com

MORE INFORMATION

- **Massachusetts RPS**: The Massachusetts Renewable Portfolio Standard (RPS) requires load serving entities to purchase a portion of their power from qualified renewable energy facilities. Certain hydroelectric generating facilities can qualify under this incentive program.
  http://www.mass.gov/eea/docs/doer/rps/higher-mw-limits-for-hydro-ma-rps.pdf

- **Low Impact Hydro Institute:** The Low Impact Hydro Institute has established a certification program that ensures that qualifying facilities meet certain wildlife and sustainability-related standards.
  http://www.lowimpacthydro.org/

- **NREL:** The National Renewable Energy Labs has developed a resource guide for small hydro power facility development. This guide reviews key elements of successful small hydro projects and also discusses how to estimate the power generating potential of existing dam sites.
  http://www.nrel.gov/docs/fy01osti/29065.pdf

- **FERC Small Hydro Licensing Resources**: The Federal Energy Regulatory Commission (FERC) has regulatory oversight and licensing authority over small hydroelectric generating plants.
  http://www.ferc.gov/industries/hydropower/gen-info/licensing/small-low-impact.asp

STRATEGY 5. ASSESS REGIONAL ANAEROBIC DIGESTION PROJECT OPPORTUNITIES

Conducting an organics waste-shed analysis in Northampton and the surrounding region is necessary to evaluate the potential for constructing an anaerobic digester, which can generate renewable energy from organic feedstock.

OBJECTIVES

✪	Increase local renewable energy production and reduce GHG emissions.
✪	Reduce disposal of organic waste in landfills.
✪	Support local farmers by managing manure and creating soil amendments that can improve soil health or productivity.

BACKGROUND & STRATEGY DESCRIPTION

Organics-to-energy technologies take organic waste – including materials such as food waste, animal waste (manure), or yard waste – and convert them to renewable electricity and heat. Anaerobic digesters, a specific type of organics-to-energy technology, breaks down organic matter in the absence of oxygen (i.e. anaerobic digestion), thus producing biogas, which can be combusted to produce electricity or refined and used as renewable natural gas. Heat generated during the process can also be used for a variety of applications, including space heating for residences, process heat for industrial applications, and heating for greenhouses, among others.

Northampton could collaborate with PVPC and other nearby communities to assess the feasibility of community-supported organics-to-energy projects within the region by completing a comprehensive, multi-community waste-shed analysis. This work can build on the ongoing organics collection projects in the region, such as Amherst's MassCEC-sponsored anaerobic digestion (AD) feasibility study, among others. Under this strategy, PVPC, Northampton, and other communities will survey regional organic feedstock producers and haulers to identify the type and volume of organic feedstock, existing contractual requirements, distance waste is hauled, location of potential AD sites for processing, and suitability of organic feedstock for processing in AD systems.

BENEFITS

✚	The Massachusetts Department of Environmental Protection (MassDEP) has established a solid waste disposal ban that applies to businesses and institutions disposing of one ton or more of food waste per week. The regional organic waste-shed assessment will enable Northampton to identify opportunities to divert organic waste from landfills and potentially assist local businesses comply with the Massachusetts organic waste ban.
✚	The project will support development of renewable energy generation from organic waste, thus reducing GHG emissions in the region.

+	By identifying regional opportunities and feedstock to support development of an anaerobic digestion facility, Northampton will strengthen agriculture in the region by assisting farmers reduce environmental impacts of manure disposal and providing a sustainable supply of organic soil amendments.
+	If co-located with the existing Northampton waste water treatment plant, increased truck traffic to the facility to deliver organic material could be balanced with decreased volumes of biosolids resulting from the AD process.

RISKS

	The pre-feasibility study could reveal that there are no viable opportunities for anaerobic digestion in Northampton or the surrounding region. In the event that this occurs, Northampton's investment in the study will not result in a future AD project.
	Properly siting an AD facility will require careful consideration, particularly as an AD facility will increase truck traffic in the surrounding community.

PROJECT COSTS & ECONOMICS

Table 7 – Assess Regional Anaerobic Digestion Opportunities Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Staff time to coordinate community outreach and evaluate research results will be a major cost driver of the assessment. In addition, the City will likely incur some costs for consultants or experts, who oversee the research process on behalf of Northampton.	Not applicable.
Financial Benefits of Strategy	No direct financial benefits from implementing the feasibility study.	Not applicable.

Table 8 - Available Resources

Organization	Type of Assistance	Description
MassCEC	Organics-to-Energy Grant funding	MassCEC provides up to $50,000 in grant funding to assist municipalities or other public entities assess opportunities for organics-to-energy projects within their jurisdiction. A potential AD development site must be identified to use MassCEC Organics-to-Energy grant funding.[2]
MassDEP	Technical and Financial Assistance	MassDEP has developed a matrix of financial and technical assistance programs, which are available to Massachusetts stakeholders interested in developing anaerobic digestion projects.[3]

NEXT STEPS

Task Description	Task Lead
1. Identify and task staffing resources to develop concept and application process.	City Staff
2. Reach out to pertinent municipal staff at the City of Northampton, PVPC, and other regional communities about the assessment.	City Staff, Energy & Sustainability Commission
3. Identify funding sources to hire contractors for the study. Potential funding sources may include MassCEC Organics-to-Energy funding. Contact MassCEC to discuss options, and then prepare and submit funding application.	PVPC
4. Develop scope of work for the study. Interview three or more contractors who could perform the study and solicit bids from contractors. Review bids and select contractor.	PVPC
5. Work with selected contractors to conduct assessment.	City Staff, Energy & Sustainability Commission

CONTACTS

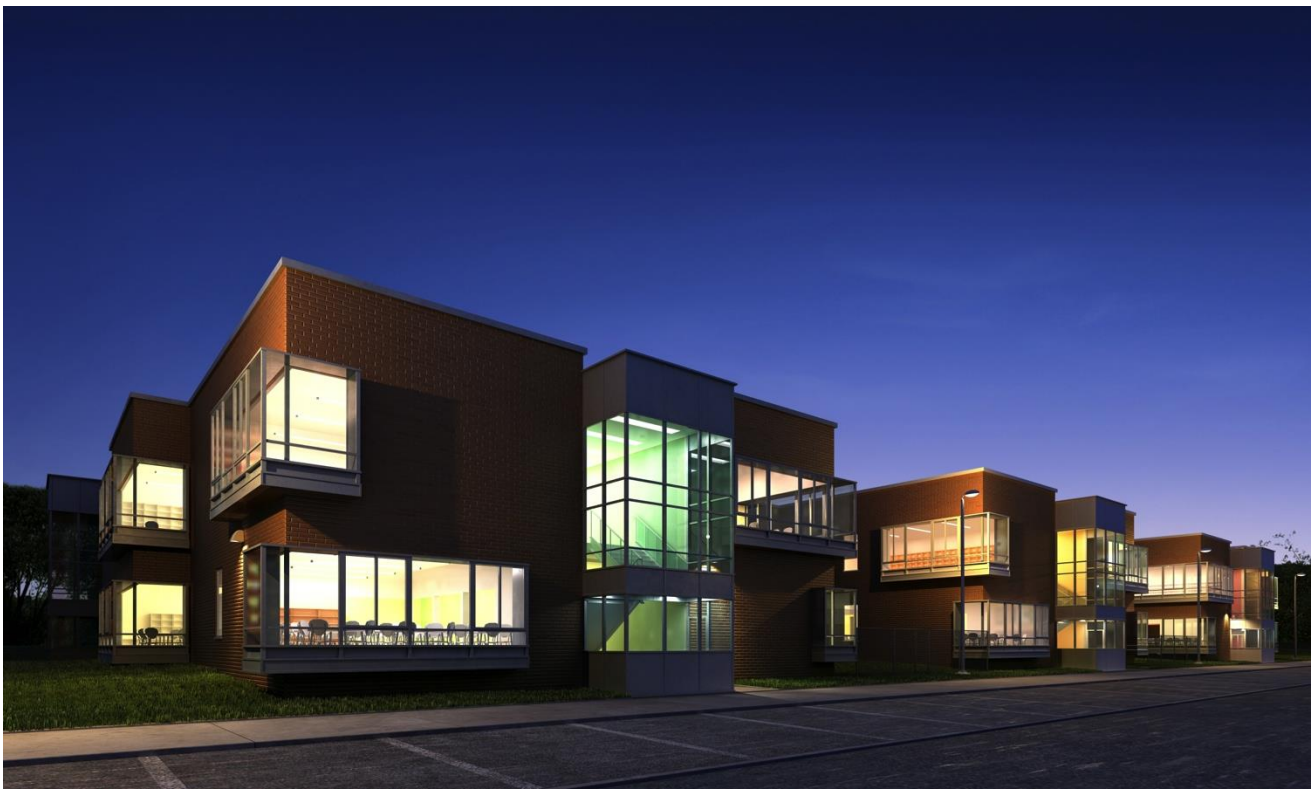
Organization	Name	Position	Email
MassCEC	Amy Barad	Program Director, Organics-to-Energy	abarad@masscec.com
PVPC	David Elvin	Senior Planner	delvin@pvpc.org

[2] Support can be used for (a) technical assistance to develop requests for qualifications (RFQs) or requests for proposals (RFPs) and other owner's agent services; (b) public engagement processes to identify organics processing options that are compatible with community needs and objectives; and (c) pre-feasibility studies for particular sites, generator clusters, or technical approaches to manage organic waste streams. Cities are required to provide at least a 5% in matching funds. For more, see: http://www.masscec.com/solicitations/technical-services-public-entities-only.

[3] For more, see: http://www.mass.gov/eea/agencies/massdep/climate-energy/energy/anaerobic-digestion/anaerobic-digestion-financing-and-technical.html

ENERGY EFFICIENCY & RESILIENCE

COMMUNITY ENERGY STRATEGIES FOR NORTHAMPTON



STRATEGY 6. IMPLEMENT PROPERTY ASSESSED CLEAN ENERGY (PACE) FINANCING

Property Assessed Clean Energy Financing may be an attractive mechanism for Northampton commercial property owners to finance large clean energy projects.

OBJECTIVES

- Implement a PACE financing program for renewable energy, energy efficiency, and building resilience technologies.

BACKGROUND AND STRATEGY DESCRIPTION

Property Assessed Clean Energy Financing (PACE) has been implemented by a number of municipalities across the United States. Under a PACE program residential or commercial property owners are loaned funds to conduct energy efficiency upgrades or install renewable energy systems. PACE loans are paid back through a special property tax assessment. This mechanism allows the loan to be transferred to new property owners and also allows loans to have debt terms that would not typically be available through traditional clean energy finance programs.

Current Massachusetts law allows for municipalities to create PACE programs, and Northampton has passed an ordinance to do so.[4] However, as currently structured by Massachusetts law, a municipal PACE program will be impractical without changes to the state's authorizing legislation. Under current state law, Northampton is required to sell bonds to finance the program, creating significant implementation challenges. There is a bill currently before the legislature (S.177) that proposes to enable Northampton to proceed with a local PACE program. This bill requires both the Department of Energy Resources (MassDOER) and MassDevelopment to coordinate state PACE financing activities, significantly simplifying implementation for Northampton. Legislators are also working to expand the current bill to allow property owners to finance climate resilience-related improvements through the PACE mechanism, as well.

Given current law, activities under this strategy are limited to efforts to support the passage of revised PACE legislation. Under this strategy, Northampton will implement a PACE program if state law changes to make it practical to do so. Additionally, Northampton will implement a residential PACE program if changes to federal regulations allow such programs to go forward. [5]

[4] For more, see: http://www.northamptonma.gov/1051/PACE-Ordinance

[5] Currently, the Federal Housing Finance Agency (FHFA) has ruled that PACE financing is not appropriate for residential properties as PACE lien obligations would subordinate loans guaranteed by Fannie Mae and Freddie Mac, the government sponsored national mortgage loan aggregators.

BENEFITS

+	Passage of new PACE legislation in Massachusetts will improve access to energy efficiency and renewable energy financing. PACE financing will serve to complement a number of existing energy efficiency programs in the Commonwealth.
+	To date, no dedicated financing options exist for property owners who are interested in investing in climate resilience measures, such as backup power and flood proofing. Passage of PACE legislation in Massachusetts will create new opportunities for building owners to make these and other critical improvements to their buildings.

RISKS

⚠	Specific risks associated with a PACE program established by Northampton will depend on the final signed legislation and executive branch regulatory rulemaking.
⚠	Risks related to individual energy efficiency or renewable energy projects are highly dependent on site specific variables and technology options.

PROJECT COSTS & ECONOMICS

Table 9 – Implement Pace Financing Study Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Northampton staff will need to dedicate time to develop and implement a PACE program.	Participating building owners will incur costs related to retrofitting their properties. Financing charges will also likely apply.
	A local PACE program may require Northampton to incur costs related to marketing the program and collecting financing payments through the current property tax collection system.	
Financial Benefits of Strategy	Not applicable.	Participating building owners will benefit from lower energy bills and potentially improved property values.

NEXT STEPS

Task Description	Task Lead
1. Publicly advocate for the passage of updated PACE legislation through city channels, nonprofit organizations, and individual Northampton residents.	Energy & Sustainability Committee
2. If necessary, develop and present updated city ordinance on PACE for City Council to review and adopt.	Energy & Sustainability Committee, Mayor
3. Implement commercial PACE initiative in partnership with state agencies.	Mayor's Office

CONTACTS

Organization	Name	Position	Email
State Senate	Senator Brian Joyce	State Senator	brian.joyce@masenate.gov
MassDevelopment	Laura Canter	Executive Vice President	lcanter@massdevelopment.com

MORE INFORMATION

- **MassDOER Study on PACE Program Options:** The MassDOER commissioned a study on PACE financing options. This study has informed PACE legislation currently before the legislature. http://www.mass.gov/eea/docs/doer/pub-info/doer-pace-study.pdf

- **Massachusetts Senate Bill 177:** Sponsored by Senator Joyce, S177 proposes to implement a state-wide PACE financing program through the coordinated efforts of MassDevelopment and MassDOER. https://malegislature.gov/Bills/BillHtml/126653?generalCourtId=11

- **PACENow.org**: This national nonprofit works to encourage the development of PACE financing programs across the United States. Their website includes a number of resources related to PACE programs that may be useful to local governments implementing programs. http://pacenow.org/

STRATEGY 7. DEVELOP COMMUNITY ENERGY EFFICIENCY MOBILIZATION PLAN

In order to meet community climate change goals, a significant proportion of the Northampton community will need to invest in energy efficiency. Under this strategy, Northampton will develop a data-driven, comprehensive energy efficiency mobilization plan.

OBJECTIVES

✪	Develop a comprehensive community energy efficiency mobilization plan that, when implemented, will reduce greenhouse gas emissions and lower energy bills in Northampton.
✪	Use existing data sources to segment the Northampton energy efficiency market and develop targeted strategies to engage a wide cross-section of the community.
✪	Better understand Northampton's building energy use and develop a more comprehensive picture of greenhouse gas emissions sources in the community.

BACKGROUND AND STRATEGY DESCRIPTION

A number of Massachusetts cities and towns have developed and implemented community engagement strategies in collaboration with utility efficiency vendors to increase adoption of energy efficiency measures. While these programs have been successful at mobilizing some segments of communities, significant opportunities remain for residents and business owners to make energy efficiency investments. Community members have expressed an interest in creating a local "cultural shift" that motivates individuals to seek out progressively more advanced energy efficiency opportunities in their homes and workplaces. This effort will be greatly enhanced by developing a more detailed and nuanced understanding of community members' motivations and attitudes towards energy efficiency investments.

Under this activity, Northampton will work to develop a comprehensive energy efficiency engagement strategy that is carefully tailored to the unique needs of the community and based on a detailed market segmentation and analysis. This strategy will use resident surveys, city building databases, and other advanced analytics to create a comprehensive plan that includes elements such as:

- Neighborhood-level efficiency service targeting and messaging.
- Priority recruitment of the City's leading employers and greenhouse gas emitters.
- Integration with existing utility energy efficiency program offerings.

As part of this strategy, Northampton will hire a firm to develop and implement market surveys, create data-driven micro-targeting strategies, and develop a comprehensive plan to drive energy efficiency investment in Northampton. Stakeholder groups including utility representatives, local employers, neighborhood groups, and others will be invited to participate in the development of the plan.

BENEFITS

+	Developing a data-driven understanding of potential energy efficiency customers will lead to more effective efforts to market utility energy efficiency programs and deep energy retrofit initiatives.
+	Inviting community members to take part in the strategy development process will assist in future recruitment efforts and ensure that the final strategy resonates with a wide range of stakeholders.

RISKS

	Developing a mobilization strategy will require Northampton to invest both staff and financial resources into creating the plan. The final effectiveness of the implemented strategy cannot be determined in advance and may be only incrementally better than more traditional energy efficiency marketing efforts.
	The data necessary to develop a detailed marketing plan may not be available or may be too costly to obtain.
	Lack of energy efficiency adoption is a complex issue and a community awareness campaign my not effectively motivate individuals to improve the energy performance of their homes and businesses.

PROJECT COSTS & ECONOMICS

Table 20- Develop Community Energy Efficiency Mobilization Plan Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	$40,000-50,000 for a firm to conduct an on-line community survey and develop an energy efficiency targeting database. Staff time to coordinate development of the community mobilization strategy.	Volunteer time to coordinate outreach to community members and recruit participants for resident survey activities.
Financial Benefits of Strategy	Not applicable for this project phase.	Not applicable for this project phase.

Table 11 - Available Resources

Organization	Type of Assistance	Description
National Grid	Data, Program Coordination, Financial Incentives	Provides historic and ongoing energy use and savings data, coordinates with the MassSAVE program, and provides MassSAVE incentives.
Columbia Gas	Data, Program Coordination, Financial Incentives	Provides historic and ongoing energy use and savings data, coordinates with the MassSAVE program, and provides MassSAVE incentives.
Center for EcoTechnology	Data, Program Coordination, Marketing	Provides historic and ongoing data on CET's local efficiency programs. Opportunity to coordinate with CET's ongoing efficiency programs and collaborate on marketing and outreach.
MassDOER	Program Coordination, Networking, Financial Assistance	Opportunity to coordinate with MassDOER's ongoing Green Community program and access information on and connections to other efficiency outreach projects in Massachusetts.
MassCEC	Program Coordination, Networking, Financial Assistance	Opportunity to coordinate with MassCEC's ongoing community outreach programs and access information on and connections to other efficiency outreach projects in Massachusetts.
Community Action	Program Coordination, Marketing	Provides historic and ongoing data on Community Action's low income electric efficiency and weatherization programs. Opportunity to coordinate with ongoing programs and collaborate on marketing and outreach.
Smith College	Interns, Engineering Studies	Intern assistance in developing and implementing marking and outreach efforts. Technical assistance in evaluating potential and measuring efficiency improvements.
Greater Northampton Chamber of Commerce	Networking, Marketing	Provides a connection with local businesses and support for marketing and outreach efforts.

NEXT STEPS

Task Description	Task Lead
1. Identify resources to hire a consultant to help develop the energy efficiency mobilization plan.	Energy & Sustainability Officer
2. Conduct an online survey to determine community interest in an enhanced efficiency outreach program and to recruit local volunteers to assist with strategy development process. This work will be conducted with the assistance of the Energy & Sustainability Commission.	Mayor's Office, Energy & Sustainability Officer
3. Procure a consultant to help develop the plan. The Energy & Sustainability Commission will assist in this effort.	Energy & Sustainability Officer
4. Assist with stakeholder recruitment, data collection and other plan development activities. Community volunteers and program partners will support this activity.	Energy & Sustainability Officer,
5. Publish the final community energy efficiency mobilization strategy and begin implementation.	Mayor's Office, Energy & Sustainability Officer

CONTACTS

Organization	Name	Position	Email
MassDOER	Jim Barry	Western Massachusetts Green Communities Coordinator	jim.barry@state.ma.us
Columbia Gas	Elizabeth Cellucci	Director of Energy Efficiency	ecellucci@nisource.com
National Grid	Sneha Sachar	Program Strategy - Massachusetts	sneha.sachar@nationalgrid.com
CET	John Majercak	Executive Director	john.majercak@cetonline.org
Community Action!	Peter Wingate	Energy Director	pwingate@communityaction.us
Smith College	Deirdre Manning	Environmental Sustainability Director	dmanning@smith.edu

MORE INFORMATION

- **MassSAVE:** Mass Save is an initiative sponsored by Massachusetts gas and electric utilities and energy efficiency service providers that provides a wide range of services, incentives, trainings, and information promoting energy efficiency that help residents and businesses manage energy use and related costs. http://www.masssave.com/

- **Cambridge Energy Alliance:** The Cambridge Energy Alliance (CEA) is a part of city government and helps Cambridge residents and businesses identify and arrange financing for all cost-effective energy efficiency improvements for their homes and businesses. CEA works with organizations that provide energy auditing capability, construction expertise, and financial resources. It serves as a case study that can inform Northampton of options for implementing a city-run energy efficiency program. http://cambridgeenergyalliance.org/

- **Renew Boston:** Renew Boston is a network of energy efficiency providers helping to assist qualified Boston tenants, homeowners, and landlords in making energy improvements to their homes and properties. The City of Boston and its partner Mass Save provide eligible Bostonians with no-cost home energy assessments and incentives for energy efficiency upgrades, including insulation, air sealing, water saving devices, and high-efficiency light bulbs. It serves as a case study that can inform Northampton of options for implementing a city-run energy efficiency marketing initiative. http://www.renewboston.org/

STRATEGY 8. IMPLEMENT LED STREET LIGHTING RETROFITS

LED street lights can significantly lower municipal electricity consumption and energy bills. This strategy will implement a comprehensive LED retrofit initiative.

OBJECTIVES

★	Replace older street lights with modern, efficient street lights.
★	Decrease City GHG emissions, electricity costs, and maintenance costs.
★	Improve lighting quality and design along Northampton streets.

BACKGROUND AND STRATEGY DESCRIPTION

Street lights accounted for around 12% of Northampton's municipal electricity consumption in 2009[6] but 30% of total electricity costs. LED street lights are solid-state lights that can significantly reduce energy consumption and maintenance costs compared to traditional mercury vapor and high pressure sodium street lights. Field tests have shown that, on average, replacing high-pressure sodium street lights with LED equivalents can results in a 39% energy savings[7] and LED technologies may also reduce light pollution due to their ability to focus light at targeted areas. In recent years, costs for LED street lighting technologies have declined substantially and Northampton has already completed one successful LED lighting project and seen significant cost and energy savings from that effort.

To date, there have been a number of regulatory hurdles for Massachusetts municipalities interested in replacing their existing street lights with LED technologies. However, recent changes to National Grid's street lighting tariff and its policies related to replacing light fixtures have made LED street lights more attractive for local governments to install. Under this strategy, Northampton will procure a vendor to complete a street light analysis. This comprehensive study will provide information and estimates about potential energy savings, as well as under- and over-lighting conditions in the city. Based on the results of this study, Northampton will move forward with procurement, potentially under a guaranteed savings performance contract. Northampton may also explore working with the Metropolitan Area Planning Council (MAPC) under future bulk procurement solicitations.

[6] City of Northampton. (May 2010). Municipal Energy Reduction Plan. Retrieved from: http://www.northamptonma.gov/DocumentCenter/View/80

[7] Pacific Northwest National Laboratory. (June 2013). Demonstration of LED Street Lighting. Prepared for the U.S. Department of Energy. Retrieved from: http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2013_gateway-msslc_kc.pdf

BENEFITS

+	Completing a street lighting analysis will allow Northampton to maximize the benefits of future street lighting retrofits and reduce lighting intensity in over-lit areas.
+	Installation of LED street lighting will create significant energy bill savings for Northampton and lower the City's greenhouse gas emissions.
+	LEDs lights last longer than traditional lighting technologies, meaning they require less overall maintenance, which lowers operating costs.

RISKS

⚡	While installing LED street lights through a performance contract will guarantee the City's annual energy savings, this can reduce overall potential cost savings.
⚡	As a new technology, costs for LED street lights have declined considerably in recent years. If Northampton completes an LED retrofit project in the near term, the City will not be able to benefit from potential future cost declines for LED technologies.

PROJECT COSTS & ECONOMICS

Table 32- Implement LED Street Lighting Retrofits Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Northampton will likely pay costs associated with a street lighting study if the City chooses not to proceed with an LED lighting procurement under a performance contract. Implementing an LED street lighting program will require moderate staff time to coordinate contractor activities.	Not applicable.
Financial Benefits of Strategy	Energy savings will depend on the number of lights retrofitted, however Northampton could reduce its city-wide electricity costs by up to 15%. Reduced annual City energy budgets and reduced maintenance costs.	Not applicable.

Table 13 - Available Resources

Organization	Type of Assistance	Description
Metropolitan Area Planning Council (MAPC)	Technical Assistance and Aggregate Procurement	MAPC is assisting Massachusetts municipalities with LED street light procurement through an aggregated procurement program. This involves vendor qualification, development of a street lighting study, and pricing for a comprehensive LED retrofit through a performance contract. http://www.mapc.org/led-street-lighting

NEXT STEPS

Task Description	Task Lead
1. Contact MAPC and inquire about participation in their next round of LED street lighting procurement.	Energy & Sustainability Officer
2. Assist with evaluation of vendors submitting qualifications to MAPC procurement.	Energy & Sustainability Committee
3. *Optional:* If selected vendor and/or price structure is not acceptable, Northampton will issues an RFP for LED streetlight design and procure its own vendor.	Energy & Sustainability Officer
4. Selected vendor completes comprehensive outdoor lighting review and creates retrofit pricing plan.	Street lighting vendor
5. Northampton approves or rejects lighting proposal.	City Council
6. If proposal is approved, vendor moves forward with lighting retrofit plan.	Street lighting vendor

CONTACTS

Organization	Name	Position	Email
MassDOER	Eileen McHugh	EMS Procurement Lead	eileen.mchugh@state.ma.us
MAPC	Patrick Roche	Energy Coordinator	proche@mapc.org

MORE INFORMATION

- **Metropolitan Area Planning Council (MAPC):** The MAPC has developed a municipal street light procurement toolkit that provides a step-by-step approach to completing municipal LED lighting initiatives. This toolkit includes model procurement documents, a detailed discussion of municipal street light buy-back options, and a review of potential issues decision makers should evaluate before starting an LED street light program. http://www.mapc.org/led-street-lighting

  National Grid Street Light Tariffs: National Grid maintains a number of separate tariffs for street lights. Project proponents should be familiar with these different tariff models when considering street lighting projects. http://www.nationalgridus.com/masselectric/business/rates/4_other.asp

- **MassDOER Green Communities:** MassDOER can provide support and guidance for municipalities exploring street lighting projects, particularly related to state procurement law.
  http://www.mass.gov/eea/docs/doer/green-communities/pubs-reports/led-street-lighting-slides-09-11-13.pdf
  http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/ems.html

STRATEGY 9. IMPLEMENT ENERGY REPORTING PROGRAM

Developing a building energy reporting program for large commercial and multi-family properties allows future tenants to better understand potential energy bills and incentivizes landlords to make energy efficiency investments.

OBJECTIVES

✪	Implement a building energy reporting ordinance for large commercial and multi-family buildings.
✪	Create transparency in the Northampton commercial real estate and residential rental property market related to building energy consumption.
✪	Create a data platform for tracking community progress towards reducing building greenhouse gas emissions.
✪	Increase potential tenant access to building energy consumption information, so tenants can make informed, cost-effective choices about renting work or living spaces.

BACKGROUND AND STRATEGY DESCRIPTION

Potential residential and commercial renters have limited information about the energy performance of the buildings they may decide to lease. Increased access to building energy performance data could incentivize buildings owners to invest in energy efficiency. Building Energy Reporting and Disclosure Ordinances are an increasingly popular means to achieve this. These programs are typically structured to include the following responsibilities of building owners and municipalities:

- Building owners:
  - Annually benchmark the energy performance of their properties using EPA's Portfolio Manager tool.
  - Report ENERGYSTAR scores and other key energy-related building metrics to the municipality.
- Local government:
  - Publish building energy performance data online to create market transparency and inform prospective tenants.

Energy reporting programs have been implemented in a number of larger U.S. cities, but smaller municipalities have not yet implemented such programs. Cities with programs include: Boston, Washington, D.C., Seattle, San Francisco, Chicago, and Philadelphia.

Under this strategy, the City of Northampton will develop an ordinance that will require all buildings over a certain size threshold to annually report their energy consumption and greenhouse gas emissions data. The City will then make that data available to potential building tenants in order to create market transparency, which could incentivize property owners to invest in energy efficiency. This effort will also allow Northampton to better track community greenhouse gas emissions and help to further understand opportunities for energy efficiency improvements.

BENEFITS

+	Benchmarking allows policy makers to track progress towards local and regional emissions reduction targets and modify policies accordingly.
+	Commercial and residential renters will have access to disclosure reports and will be able to make informed decisions about selecting more cost-effective and efficient spaces.
+	Benchmarking the energy performance of a building is a first step for many building owners before investing in energy efficiency technologies. By requiring benchmarking, a municipality ensures that property owners are fully aware of the energy consumption profile of their properties.

RISKS

⚠	Energy disclosure programs require utilities to provide aggregated building energy data for all tenants in a building. If a utility is unwilling to provide this information to a property owner, implementation could be challenging.
⚠	Energy disclosure programs require an enforcement mechanism to ensure building owners comply with ordinance reporting requirements. This is likely to be unpopular with property owners.
⚠	Startup costs may be prohibitive for smaller local governments and a regional implementation approach may be more appropriate.
⚠	Tenants may feel that landlord disclosure of the energy consumption of the property they rent is a privacy concern. However, for many buildings this will not be as much of an issue, considering that building-wide energy consumption cannot be disaggregated to determine the energy consumption of an individual tenant.

If the City is unable to develop and implement a building energy reporting and disclosure program, it could explore other strategies for improving energy efficiency in commercial and multi-family properties including (1) direct outreach and education for property owners and tenants regarding energy efficiency opportunities and (2) development of commercial PACE financing programs if possible (see Strategy 6 on PACE financing).

PROJECT COSTS & ECONOMICS

Table 44- Implement Energy Reporting Program Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Moderate commitment of staff time to write ordinance, develop the program, and educate the public about the reporting requirements.	Minimal costs associated with property owner's compliance with annual energy reporting requirements.
	Potential costs associated with technical assistance from a part-time contractor.	
Financial Costs of Strategy	No direct financial benefits for municipal government.	Moderate financial benefits for commercial and residential renters who choose to lease more energy efficient properties.
		Improvements in property values for building owners that choose to invest in energy efficiency.

Table 15 - Available Resources

Organization	Type of Assistance	Description
Institute for Market Transformation (IMT)	Model Policy Documents	The Institute for Market Transformation is a national nonprofit that supports the development of building benchmarking and disclosure ordinances across the U.S. They can provide model program documents and other resources related to benchmarking programs.
U.S. EPA	Benchmarking Education Resources	The U.S. EPA has a range of educational materials related to building energy benchmarking and the use of their Energy Star Portfolio Manager tool. The can also provide direct technical assistance to local governments implementing building benchmarking programs.

NEXT STEPS

Task Description	Task Lead
1. Further discuss building energy disclosure ordinance with municipal staff, energy committee, and other relevant stakeholders to gain consensus regarding this strategy.	Energy & Sustainability Officer, Energy & Sustainability Committee
2. Identify potential outside support resources from MassDOER, U.S. EPA, and/or the Institute for Market Transformation to develop draft ordinance.	Energy & Sustainability Officer
3. Reach out to the local gas and electric utilities to discuss reporting data needs and get support for providing whole building energy data to property owners.	Energy & Sustainability Officer
4. Discuss potential regional collaborative efforts with other surrounding communities (potentially through PVPC or other regional organizations).	Energy & Sustainability Officer, Energy & Sustainability Committee
5. Develop a draft ordinance and conduct public outreach to solicit feedback from the community.	Energy & Sustainability Committee

6. Pass ordinance and implement program.	City Council, Energy & Sustainability Officer, Energy & Sustainability Committee

CONTACTS

Organization	Name	Position	Email
Institute for Market Transformation (IMT)	Andrew Burr	Director, Building Energy Performance Policy	andrew@imt.org
City of Boston	Carl Spector	Director, Climate and Environmental Planning	carl.spector@cityofboston.gov

MORE INFORMATION

- **City of Boston:** The City of Boston passed a building energy reporting and disclosure ordinance in the spring of 2013. This could be used as a potential model for Northampton. Regulations enacted defining the implementation of the City of Boston's ordinance are available here: http://www.cityofboston.gov/eeos/reporting/

- **Institute for Market Transformation (IMT**): The IMT is a national nonprofit that supports the development and implementation of building energy reporting and disclosure ordinances throughout the country. They maintain a dedicated website focused on benchmarking policies. http://www.buildingrating.org/

- **U.S. Environmental Protection Agency**: The U.S. EPA has a number of training resources available related to its Energy Star Portfolio Manager benchmarking tool. EPA provides online trainings and has supported a number of local governments with implementation of their building benchmarking programs. http://www.energystar.gov/buildings/

STRATEGY 10. INCREASE PUBLIC SAFETY THROUGH IMPROVED COMMUNITY ENERGY RESILIENCE

Extreme weather events such as Hurricane Sandy have exposed the vulnerability of energy systems. By increasing the resilience of critical infrastructure through energy storage, micro grids, and renewable technologies, the community of Northampton can improve its preparedness and energy independence.

OBJECTIVES

✪	Develop a long-term plan to harden critical Northampton facilities against long-term power outages and potential brownouts.
✪	Evaluate energy storage for critical City infrastructure, along with integration of clean energy generation and resilient micro-grids.

BACKGROUND

Recent severe weather has highlighted the importance of energy system resilience to public health and safety and local governments in Massachusetts are responsible for providing emergency response services and emergency shelter facilities to their residents. Given this critical responsibility, the City of Northampton is currently working with Sandia National Labs, National Grid, and a consultant to evaluate City infrastructure for suitability for emergency power and micro-grid systems. Results of this evaluation highlighted several City buildings that will be the focus of future energy resilience planning.

Potential technologies explored include combined heat and power, solar-battery backup systems, and micro-grids. While many of these technologies are well-established, financing and funding for energy resilience projects has been a challenge. Under this strategy, the City of Northampton will work to access state funds to develop energy projects that improve the energy security of these sites. Massachusetts recently made available $40 million for improving public safety through improved energy infrastructure and some of this funding was available during the fall of 2014. This activity included close collaboration with National Grid and state partners in order to ensure that projects will be successfully integrated into the existing power grid. Additionally, this strategy should be coordinated with efforts to evaluate solar at City parking lots and other city properties (see Strategy 2).

BENEFITS

✚	Improved emergency preparedness, public safety, and public health during grid failure events.
✚	Increased energy independence and potential lowered energy costs if renewable generation and battery storage are integrated into the resilience strategy.
✚	Many energy resilience technologies have potential co-benefits of reducing energy consumption and lowering greenhouse gas emissions.

RISKS

	Developing energy resilience infrastructure projects that are designed to operate during power outages is more complicated than more traditional distributed generation technologies. This added complexity may make some projects either too expensive or technically unfeasible.
	Regulatory barriers to energy storage technologies may prevent development of some energy resilience projects.
	State funding for energy resilience projects will likely be highly competitive and Northampton may not be able to access the funds necessary to implement resilience projects.

PROJECT COSTS & ECONOMICS

Table 56- Improve Community Energy Resilience Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Implementing this strategy will require significant commitment of staff time. Northampton may need to provide funding for a portion of the installation of distributed energy resilience systems. These costs could be substantial or minimal depending on the availability of funding from other sources and the ownership structures chosen.	Not applicable.
Financial Benefits of Strategy	Potentially substantial ongoing savings from onsite generation technologies.	Potentially substantial in the event of a long-term power outrage.

Table 17 - Available Resources

Organization	Type of Assistance	Description
MassDOER	Feasibility Studies	MassDOER provided competitive funding for feasibility studies for energy resilience distributed technologies in the second half of 2014. Examples can be found here: http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/resiliency/resiliency-initiative.html
National Grid	Technical Assistance, Rebates	National Grid provides rebates and funding for technical studies of a range of energy resilience technologies, including combined heat and power and energy efficiency. These funds are provided through the MassSAVE program.

NEXT STEPS

Task Description	Task Lead
1. Review results of recent energy resilience reports and develop prioritized list of potential projects.	Energy & Sustainability Officer
2. Apply for MassDOER funding for technical studies when available.	Energy & Sustainability Officer
3. Conduct feasibility assessments with state funds for critical sites.	Study Vendor
4. Evaluate results of feasibility assessments and move forward with projects where appropriate	City Staff

CONTACTS

Organization	Name	Position	Email
MassDOER	Amy McGuire	Project Coordinator	amy.mcguire@state.ma.us

MORE INFORMATION

- **Rebuild Smart Report:** The National Electric Manufacturers Association has developed a report that reviews key technologies decision makers should consider integrating into resilient energy systems. http://www.nema.org/Storm-Disaster-Recovery/Documents/Storm-Reconstruction-Rebuild-Smart-Book.pdf

- **Economic Benefits of Grid Resilience Report:** Developed by the U.S. Dept. of Energy, the *Economic Benefits of Increasing Electric Grid Resilience to Weather Outages* report outlines the costs and benefits of grid resilience technologies from a national perspective. http://energy.gov/sites/prod/files/2013/08/f2/Grid%20Resiliency%20Report_FINAL.pdf

- **MassDOER Grid Resilience Program Summary:** The MassDOER provided funding for local governments to evaluate energy resilience projects during 2014. http://www.mass.gov/eea/docs/doer/energy-resiliency-fact-sheet.pdf

SUSTAINABLE TRANSPORTATION

COMMUNITY ENERGY STRATEGIES FOR NORTHAMPTON

STRATEGY 11. IMPLEMENT ELECTRIC VEHICLE PURCHASING POLICY

The City of Northampton can lead by example by developing a policy which requires plug-in vehicles to be purchased for fleet replacements. These vehicles will serve to increase community awareness about electric vehicles and foster interest in improved charging infrastructure.

OBJECTIVES

★	Implement a municipal electric vehicle purchasing policy that requires Northampton to purchase or lease plug-in vehicles when cost effective and appropriate.
★	Reduce transportation costs by shifting away from petroleum-based fuels.
★	Reduce tail-pipe and greenhouse gas emissions by deploying electric vehicles.
★	Promote awareness of plug-in vehicle technologies within the Northampton community.

BACKGROUND

Plug-in electric vehicles are now widely available in the United States. Mainstream vehicle manufacturers have introduced a number of new plug-in vehicle models in recent years, including Toyota, Ford, GM, Nissan, Honda, and Mitsubishi, among others.[8] Plug-in vehicles include both battery electric vehicles (BEVs), which operate solely on battery power, and plug-in hybrid electric vehicles (PHEVs), which can operate either from battery power or through an internal combustion engine. These vehicles have a number of advantages over traditional internal combustion engine vehicles, including the following:

- Reduced greenhouse gas and criteria pollutant emissions.
- Reduced operating costs when running in electric mode (experts report that typical plug-in vehicles running in electric mode operate at an equivalent of $1 per gallon).
- Potentially significant reductions in petroleum consumption depending on driving patterns, charging frequency, and source of electricity generation.

As of 2013, Northampton residents and businesses had 24 plug-in electric vehicles registered in the City. This ranked Northampton as 17 out of 351 Massachusetts municipalities on a per car basis. Northampton has taken significant steps to develop public electric vehicle charging infrastructure and currently has eight public charging stations. These have been funded with grants from the Massachusetts Department of Energy Resources (MassDOER). The City is also exploring leasing several electric vehicles using state grants.

Under this strategy, Northampton will develop an electric vehicle (EV) purchasing policy that requires the City to buy or lease electric vehicles when appropriate and cost effective. This policy could also include an evaluation of internal car-sharing opportunities to better distribute the increased capital costs of EVs. This policy will be similar to the City's current energy efficient vehicle procurement policy that was adopted as part the Northampton's Green Communities designation.

[8] A full list of currently available electric vehicles is available at: http://www.pluginamerica.org/

BENEFITS

+	Plug-in electric vehicles contribute to emission reductions, decreased dependence on hydrocarbons, and improve air quality.
+	Plug-in electric vehicles lower municipal fuel costs and overall vehicle operating costs.
+	Implementing a plug-in vehicle procurement policy will also promote local awareness of the availability and performance of this relatively new vehicle technology.

RISKS

⚠	Electric vehicles may not be appropriate for all municipal vehicle types, so the policy should be carefully crafted to ensure that vehicles are only procured where appropriate.
⚠	Battery electric vehicles do have limited ranges and may not be appropriate for all purposes. Any purchase of BEVs should evaluate potential issues related to battery life and driving range. This is not an issue for PHEVs as these vehicles can operate on standard gasoline when the vehicle's battery has been fully discharged.
⚠	Risks related to battery integrity in the event of an accident are a concern for first responders. Given this potential issue, the state has developed an electric vehicle license plate. This plate is intended to ensure that first responders take appropriate precautions when working around damaged electric vehicles.[9]

PROJECT COSTS & ECONOMICS

Table 68- Implement Electric Vehicle Purchase Policy Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Increased incremental cost of purchasing electric vehicles over standard-fuel models. This is roughly $10,000 per vehicle without subsidies.	Not applicable.
	Minimal staff time to develop and introduce an ordinance or other policy mechanism requiring electric vehicle procurement.	
Financial Benefits of Strategy	Decreased fuel costs and lower regular maintenance costs. At current prices, electric vehicles can operate at the equivalent of $1 per gallon of gas.	Not applicable.

[9] For more, see: http://www.mass.gov/eea/pr-2012/120424-pr-ev-plates.html

Table 19 - Available Resources

Organization	Type of Assistance	Description
MassDEP	Financial Incentives	MassDEP has previously provided grants to local governments to procure electric vehicles and charging stations through the MassEVIP program. Future funding under this initiative may be available at a later date.

NEXT STEPS

Task Description	Task Lead
1. Create internal City working group to discuss potential for development of City plug-in vehicle purchasing policy.	Energy & Sustainability Officer, Energy & Sustainability Commission
2. Develop draft City ordinance modeled after existing energy efficient vehicle purchasing policy.	Energy & Sustainability Officer
3. Introduce draft ordinance to City council for review and public discussion.	City Staff
4. Implement policy as appropriate during regular vehicle purchasing cycles.	City Staff

CONTACTS

Organization	Name	Position	Email
MassDEP	Sejal Shah	MassEVIP Program	sejal.shah@state.ma.us

MORE INFORMATION

- **Plug-in Electric Vehicle Action Tool:** The Center for Climate and Energy Solutions provides a resource for learning about PEVs and best practices. Although state DOTs are the primary audience, many of the suggested actions and resources in the tool are applicable to other public entities such as local governments and other state agencies. http://www.c2es.org/pev-action-tool

- **Siting and Design Guidelines for Electric Vehicle Supply Equipment:** This report provides design guidelines and best practices to help local governments, businesses, homeowners, developers, and other interested parties identify and diagram key siting and design issues for electric vehicle charging equipment. http://www.transportationandclimate.org/siting-and-design-guidelines-electric-vehicle-supply-equipment

- **Massachusetts Electric Vehicle Incentive Program (MassEVIP):** MassEVIP helps Massachusetts cities and towns acquire electric vehicles and charging stations by offsetting the higher initial cost of these advanced technologies. http://www.mass.gov/eea/agencies/massdep/air/grants/massevip.html

STRATEGY 12. DEVELOP REGIONAL BIKE SHARING SYSTEM

Northampton, in collaboration with surrounding cities and towns, can increase transportation options for residents by partnering with vendors to develop and implement a regional bike sharing program.

OBJECTIVES

★	Reduce vehicle use and increase access to alternative transportation modes.
★	Develop bike-share initiative that encourages exercise and healthy living.
★	Integrate bike sharing system into regional public transit system to extend travel range of transit customers.

BACKGROUND & STRATEGY DESCRIPTION

Bike sharing programs are emerging as a popular option to increase mobility in cities such as Boston, New York, London, and Paris. A bike sharing program provides a rentable fleet of bikes, which can obtained from and returned to docking stations around communities, often for a relatively small fee. The service is akin to car-sharing services like ZipCar. Though most common in large cities, bike sharing programs are beginning to be implemented in smaller municipalities, such as Boulder, Colo.,[10] Salem, Mass.,[11] and Madison, Wis.[12] A potentially promising model uses "smart bikes" equipped with GPS technology to help monitor and manage the program, instead of more traditional bike share stations. Such an approach may be more suitable for municipalities like Northampton in the Pioneer Valley, as it provides greater flexibility for a regional approach. In fact, in collaboration with several regional municipalities, the PVPC is currently implementing a feasibility study to assess these issues in addition to regional bike sharing models, customer demand, financial feasibility, and capital funding requirements (and sources), among other issues.

In addition to connections with the regional bus transit system, a regional bike-sharing program that includes Northampton will help interconnect the region's bike and pedestrian paths with Amtrak passenger rail service, which is being realigned to serve the downtown Northampton station, as well as the existing station in Springfield. As an extension of the existing public transit infrastructure, in order to be financially viable, bike share programs may need integrated funding strategies that seek funding beyond user fees.

Based upon findings of its feasibility analysis, Northampton will work with PVPC to develop a request for proposals (RFP) to procure a vendor to design and implement the regional bike sharing concept. In response to the RFP, vendors will be expected to:

- Describe their proposed business model and services, including risks, benefits, and key considerations.
- Describe proposed bike sharing routes, locations for bike stations, and target audience for the Pioneer Valley region.

[10] For more, see: https://boulder.bcycle.com/default.aspx
[11] For more, see: http://www.salem.com/pages/salemma_webdocs/spins?textPage=1
[12] For more, see: http://momentummag.com/features/bike-share-finds-success-in-small-cities/

- Describe funding and capital requirements, as well as expected operational costs and revenues, with the aim to make the program self-sustainable over time.

BENEFITS

+	By collaborating with a successful bike sharing vendor, Northampton and PVPC will continue developing a more resilient transportation network that is less reliant on fossil fuels.
+	The bike sharing program will provide travelers with more alternatives to auto travel for commuting, shopping, errands, and visits, thereby improving the interconnectedness of the region's transportation network.

RISKS

⚠	There is a risk that there will be an insufficient number of qualified program vendors willing to respond to the RFP. Northampton and PVPC should assess whether there are enough bike sharing program vendors that will be willing to respond to the RFP with sufficient experience and expertise to run a program on a regional scale.
⚠	Profitability has historically been a challenge for bike share programs, and in a number of cases municipalities have had trouble securing sufficient funds to operate the system. It is essential that bike sharing program providers can provide evidence in their proposals that they can operate a financially stable program at a regional scale.

PROJECT COSTS & ECONOMICS

Table 20- Develop Regional Bike Share Program Costs and Benefits

	To the **City of Northampton**	To the **Northampton Community**
Financial Costs of Strategy	Staff time to support the development and coordination of the RFP and evaluate responses. Additional costs may include the use of outside consultants, lawyers, or experts to assist in the development of procurement documents or evaluate proposals.	Not applicable.
Financial Benefits of Strategy	Financial benefits if bike share program can offset need for additional transportation options of fleet purchases.	Financial benefits if bike share program can offset need for additional transportation options.

Table 21 - Available Resources

Organization	Type of Assistance	Description
MassDOT Bicycle Transportation	Technical Assistance	Mass Department of Transportation provides a number of resources to assist Massachusetts regions improve biking infrastructure. www.massdot.state.ma.us/GreenDOT/BikeandPedCoordinators.aspx

NEXT STEPS

Task Description	Task Lead
1. Review results of the PVPC "bike sharing feasibility study" and determine whether to proceed. Conduct preliminary interviews with bike sharing program vendors, as appropriate, and identify key questions and requirements for a successful bike sharing program in Northampton and the Pioneer Valley.	PVPC and Northampton Staff
2. Identify appropriate procurement pathways including whether to procure under an RFQ or RFP.	PVPC and Northampton Staff
3. Develop and publish procurement documents.	PVPC and Northampton Staff
4. Collect and evaluate responses.	PVPC and Northampton Staff
5. Select winning bid (if any) and proceed with project implementation.	PVPC and Northampton Staff

CONTACTS

Organization	Name	Position	Email
Massachusetts Department of Transportation	Daryl Amaral	Bike/Pedestrian Coordinator	daryl.amaral@dot.state.ma.us
PVPC	Josiah Neiderbach	Planner	jneiderbach@pvpc.org

MORE INFORMATION

- **Bikeshare.com:** This industry website provides news related to the bike share industry, including information about local government efforts around the country and updates on new innovations in the industry. http://www.bikeshare.com

- **Social Bicycles (bike sharing vendor):** Social Bicycles offers affordable and scalable bike share technology, equipped with a GPS-enabled locks that work with regular bike racks. http://www.socialbicycles.com

- **Alta (bike sharing vendor):** Alta designs, deploys, and manages bicycle sharing systems. They provide solutions for all aspects of bike share, from location assessment and business modeling to system maintenance and expansion. http://www.altabicycleshare.com

CONCLUSION AND OUTLOOK

Over the past several years, Northampton has made significant progress in clean energy, developing projects in the residential, commercial and municipal sectors across the city. For example, Northampton was recently selected as a STAR community, a nation-wide pilot which works to improve the sustainability of U.S. cities. City schools have installed large solar arrays and the municipality has committed to building all new structures to LEED standards. Additionally, businesses and industry were engaged through an innovative Energy Concierge pilot program to encourage increased energy efficiency projects. Clearly, the community is also engaged and interested in promoting sustainability and clean energy throughout Northampton.

With this *Northampton Clean Energy Roadmap*, Northampton has clarified its clean energy vision for the future. The strategies outlined in this roadmap represent the next step in the city's clean energy development process. By implementing these projects, Northampton can take concrete steps towards achieving its clean energy goals while positioning itself as a clean energy leader in the Commonwealth and across the United States.